



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/023,109

12/14/2001

Jakob Nielsen

58683-00002USPX

2393

7590

08/23/2004

Brian D. Walker, Esq.  
Jenkins and Gilchrist, P.C.  
3200 Fountain Place  
1445 Ross Ave.  
Dallas, TX 75202

EXAMINER

LAO, LUN S

ART UNIT

PAPER NUMBER

2643

9

DATE MAILED: 08/23/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/023,109

Applicant(s)

NIELSEN ET AL.

Examiner

Lun-See Lao

Art Unit

2643

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 15 May 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-43 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-43 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Introduction***

1. This action is response to the amendment filed on 06-15-2004. Claims 1, 4-7, 10, 16, 19-24, and 42-43 have been amended and claims 1-43 are pending.

### ***Claim Objections***

2. Claim 5 is objected to because of the following informalities: claim5 recites " for of" on line 6, which appears to be – ~~for~~ of --. Appropriate correction is required.
3. Claims 7, 21 are objected to because of the following informalities: claim 7 recites " a the" on line 2, which appears to be – a the --. Appropriate correction is required.
4. Claim 10 is objected to because of the following informalities: claim 7 recites " may be is" on line 2, which appears to be – ~~may-be~~ is --. Appropriate correction is required.
5. Claims 22 and 23-27, 30-32 objected to because of the following informalities: claim 22 recites " a the" on line 2, which appears to be – a the --, and (c) (c)" on line 2, which appears to be – ~~(c)~~ (c) --. Appropriate correction is required.

### ***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

Art Unit: 2643

invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1-7, 10-11, 15-22, 28-29, 31 and 33-43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chabries (US PAT. 5,029,217) in view of Chabries (US PAT. 4,658,426).

Consider claims 16, 43 Chabries teaches an apparatus for equalizing output signals from a plurality of signal paths, the apparatus comprising of:

(a) means for identifying a transfer function (see fig.5, (502,504)) for each of the signal paths;

(b) means (501, 505) for determining, base on the transfer function (FRI), a filtering function (501, 502, 504,505) for each signal path such that a product of the transfer function and the filtering function is a selected function; and

(c) means (503) for applying the filtering function (FFT) to the corresponding signal path, thereby correcting the transfer function of the signal path to the selected function to equalize (503) the output signals from the signal paths (see col.12 line 63-col.13 line 53), but Chabries (217) does not clearly teach the signal path including a microphone.

However, Chabries (426) teach the means (see fig.4, ( $Y_o(N)$ ,  $Y_1(n)$ ...  $Y_{m-1}(n)$ )) identifying a transfer function of the signal path inherently (because, a microphone connects to a channel for picking up a signal from  $X_o(n)$ ,  $X_1(n)$ ...  $X_{m-1}(n)$ ) including a microphone for each of the signal paths (see fig.4, ( $X_o(n)$ ,  $X_1(n)$ ...  $X_{m-1}(n)$ ) and col.6 line 39-col.7 line 65).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teaching of Chabries (217) and Chabries (426) to provide a device adapted to filter background noise from speech in real time so as to improve speech intelligibility.

As to claims 1 and 42, these are method claims of claims 16 and 43 and thus note the rejections of claims 16 and 43, respectively.

Consider claims 17-18, Chabries teaches an apparatus of the selected function is the transfer function (see fig.5, (502,504)) for one of the signal paths (see col.11 line 61-col.12 line 63); and an apparatus of the filtering function is determined such that a product of the transfer function and the filtering function is a common factor (see fig.5, (501,505) and col.11 line 61-col.12 line 63).

As to claims 2-3, these are method claims of claims 17-18 and thus note the rejections of claims 17-18, respectively.

Consider claims 19-20 Chabries teaches an apparatus the filtering function applying means comprises:

- (a) a filter means (see fig.5, 501, 505) provided to the signal path; and
- (b) means (503) for applying the filtering function to the filter means (501,502, 504,505) for its corresponding signal path, thereby equalizing (503) output signals from the filter means (501,502,504,505) of the signal paths (see col.12 line 63-col.13 line 53); and an apparatus of the transfer function identifying means comprises:

- (a) means (see fig.3, 301) for providing a sample signal to the signal path to produce a sample output signal through the signal path; and

(b) means (301) for processing the sample signal and the sample output signal to identify the transfer function for its corresponding signal path (see col.6 line 18-57).

As to claims 4-5, these are method claims of claims 19-20 and thus note the rejections of claims 19-20, respectively.

Consider claim 21, Chabries (217) does not clearly teach an apparatus of the signal path comprises (a) a microphone for converting a sound signal to an electrical analog signal; and (b) an analog-to-digital converter coupled to the microphone for converting the electrical analog signal into a digital signal, wherein said transfer function identifying means comprises:

(a) means for providing a noise sample to the microphone to produce a sample output signal through the signal path; and

(b) means for processing the noise sample and the sample output signal to identify the transfer function of its corresponding signal path.

However, Chabries(426) teaches an apparatus of the signal path comprises (a) a microphone (see fig.9, 2) for converting a sound signal to an electrical analog signal; and (b) an analog-to-digital converter (4) coupled to the microphone (2) for converting the electrical analog signal into a digital signal, wherein said transfer function identifying means comprises:

(a) means (10) for providing a noise sample to the microphone (2) to produce a sample output signal through the signal path; and

(b) means (2) for processing the noise sample and the sample output signal

Art Unit: 2643

to identify the transfer function (40,42) of its corresponding signal path (col.13 line 23-col.14 line 18).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teaching of Chabries (217) and Chabries (426) to provide a device adapted to filter background noise from speech in real time so as to improve speech intelligibility.

As to claim 6, there is method claim of claim 21 and thus note the rejection of claim 21.

Consider claim 22, Chabries (426) teaches an apparatus according of the signal path comprises (a) a microphone for converting a sound signal to an electrical analog signal; and (b) an analog-to-digital converter coupled to the microphone for converting the electrical analog signal into a digital signal, wherein said transfer function identifying means comprises:

(a) means (speaker) for acoustically providing a noise sample to the microphone (see fig.1, 54,56) with a propagation time delay to produce a first output processed through the signal path;

(b) means (speaker) for providing a second output corresponding to the noise sample with the propagation time delay; and

(e) means (speaker) for processing the first output (54,56) and the second output (54,56) to identify the transfer function (adaptive filter, 52) of its corresponding signal path (see col.4 lines 13-62).

As to claim 7, there is method claim of claim 22 and thus note the rejection of claim 22.

Consider claim, 28 Chabries (426) teaches the transfer function (see fig.9, 40, 42) of the signal path is a transfer function of said microphone (2 and see col.13 line 24-54).

As to claim 10, there is method claim of claim 28 and thus note the rejection of claim 28.

Consider claims 29, 31 Chabries (426) teaches an apparatus the propagation delay time is selected to be integer multiple of said first noise sample (see col.2 line 53-col.3 line56); and the said first and second digital noise signals (x,y) are a random noise signal (background noise and see col.2 line 30-col.3 line56).

As to claims 11 and 15, these are method claims of claims 29 and 31 and thus note the rejections of claims 29 and 31, respectively.

Consider claims 36-38 Chabries (426) teaches an apparatus is comprising a listening device; and hearing aid, and headset (earphone)(see col.13 lines 23-54).

As to claims 33-35, these are method claims of claims 36-38 and thus note the rejections of claims 36-38, respectively.

Consider claims 39-41 Chabries (217) teaches a hearing aid (a listening device and a headset) comprise a signal equalization (see fig.5, (503)) filter (see col.12 line 64-col.13line 6).

8. Claims 8, 12, 23 and 25-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chabries (US PAT. 5,029,217) as modified by Chabries (US

PAT.4,658,426) as applied to claims 1-7 and 16-22 above, and further in view of Brainard, II (US PAT. 6,048,320).

Consider claim 23, Chabries (217, 426) teaches an apparatus of the noise sample providing means comprises:

Means (see fig.1, 56, reference signal converting to adaptive filter) for converting the first digital noise signal into said noise sample (see col.4 lines 15-62), but Chabries does not teach the means a first noise generator for generating a first noise signal.

However, Brainard teaches an apparatus of the noise sample providing means comprises:

(a) means (see fig.2, 32) a first noise generator for generating a first noise signal; and

(b) means (see fig.2,14) for converting the first digital noise signal into said noise sample (see col.3 lines 33-62).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teaching of Chabries into Brainard provide the apparatus is controlled by a processor. The processor is adapted to generate the source signal which will preferably contain pseudo- random noise.

As to claim 8, there is method claim of claim 23 and thus note the rejection of claim 23.

Consider claim 25 Brainard teaches an apparatus of the first digital noise signal providing means is a maximum length sequence generator (see fig.2, 32 and col.3 lines 33-62 and col.5 lines 50-53).

As to claim 12, there is method claim of claim 25 and thus note the rejection of claim

Consider claim 26 Chabries (426) teaches an apparatus of the converting means includes a digital-to-analog converter (see fig.9 8) and a loud speaker (10 and see col.13 line 24-54).

9. Claims 9, 12-13, 15 and 24-25, 27, 31-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chabries (US PAT. 5,029,217) and Chabries (US PAT.4,658,426) as modified by Brainard, II (US PAT. 6,048,320) as applied to claims 1-8 and 16-23 above, and further in view of Belmonte (US PAT. 3,997,764).

Consider claim 24 Chabries (426) teaches an apparatus of a second output providing means comprises:

means for delaying the second digital noise signal (y) by same amount of time as said propagation delay time (see col.2 line 30-col.3 line 56); and

means for compensating the conversion factor (weighted) of said first digital noise signal (x) into said noise sample (see col.2 line 30-col.3 line 56), but Chabries fails to teaches the means a second noise generator for generating a second digital noise signal, the second digital noise signal being synchronized with said first digital noise signal and having properties corresponding to said first digital noise signal.

However, Belmonte teaches the means (see fig.4, 22 (pseudo-random noise generators)) a second noise generator for generating a second digital noise signal, the second digital noise signal being synchronized (by a clock frequency  $f_0$ ) with said first digital (see Col.4 lines 11-31).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teaching of Chabries and Brainard into the teaching of Belmont provide the hearing enhancement apparatus process signal.

As to claim 9, there is method claim of claim 24 and thus note the rejection of claim 24, respectively.

Consider claims 25, 27, Belmont teaches an apparatus of the first (see fig.4, 14) digital noise signal providing means is a maximum length sequence (pseudo-random noise) generator; and the second digital noise providing means (see fig.4, 22) includes a maximum length sequence (pseudo-random noise) generator (see col.4, line 11-31).

As to claims 12-13, these are method claims of claims 25 and 27 and thus note the rejections of claims 25 and 27, respectively.

Consider claims 31-32, Belmonte teaches the said first and second digital noise signals are a random noise signal (see fig.4, 14,22 (pseudo-random noise)). and an apparatus of the first (see fig.4, 14) and second digital noise signals (see fig.4,22) are provided by a single source ((pseudo-random noise) and see col.4 lines 11-31).

As to claim 15, there is method claim of claim 31 and thus note the rejection of claim 31, respectively.

Claims 14, 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chabries (US PAT. 5,029,217) and Chabries (US PAT.4,658,426) as modified by Brainard, II (US PAT. 6,048,320) and Belmonte (US PAT. 3,997,764) as applied to claims 1-9 and 16-24 above, and further in view of Fang et al (US PAT. 6,480,610).

Consider claim 30, Belmonte to teach an apparatus of the first and second

Art Unit: 2643

digital noise signals are a noise signal (see fig.4, 14, 22 (pseudo-random noise)), but Belmonte does not teach a white noise signal.

However, Fang teaches a white noise signal (see fig.5 583, (white noise generator)) (see col.7 line 25-col.8 line 29).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teaching of Chabries and into Fang provide the most suitable type of noise for training.

As to claim 14, there is method claim of claim 30 and thus note the rejection of claim 30.

### ***Response to Arguments***

10. Applicant's arguments with respect to claim1-43 have been considered but are moot in view of the new ground(s) of rejection.

Applicant argued that Chabries (426) fails to teach or suggest processing noise to identify the transfer function of a signal path including a microphone. (remarks page 10, third paragraph).

The examiner respectfully disagrees. Chabries(426) teaches processing noise (see fig.1, 56 (reference)) to identify the transfer function(52) of a signal path including a microphone (56 and see col.4 lines 30-40). It meets the limitation of the claim recited.

***Conclusion***

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

13. Any response to this action should be mailed to:

Commissioner of Patents and Trademarks

Washington, D.C. 20231

or faxed to: (703) 872-9306

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington.

VA., Sixth Floor (Receptionist).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lao,Lun-See whose telephone number is (703) 305-2259. The examiner can normally be reached on Monday-Friday from 8:00 to 6:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Curtis Kuntz, can be reached on (703) 305-4708.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Technology Center 2600 whose telephone number is (703) 306-0377.

Lao,Lun-See  
Patent Examiner  
US Patent and Trademark Office  
Crystal Park 2  
(703305-2259)

  
**DUC NGUYEN**  
**PRIMARY EXAMINER**